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Grass Sickness in Horses.*

By WILLIAM BROWN, M.R.C.V.S., Aberdeen.

The results of investigation into this serious, and very fatal disease, which has, comparatively recently, appeared within our shores, have been so fully reported in the veterinary press that it is unnecessary for me to go into exhaustive details. I understand that very few of you have, so far, met with cases of this malady in the Midland Counties, and I trust that you will continue to remain in this happy position. In parts of Scotland it has now become a very common and much dreaded disease, and it has made its appearance in certain counties in England. The first outbreak, as far as can be traced, occurred in Barry Camp, near Dundee, in 1909. In succeeding years it spread through the counties of Forfar and Perth, and is now very prevalent along the east coast of Scotland and England, from Sutherland to Northumberland. A very significant point to note is that the disease is practically confined to areas where horses are fed on artificially sown grasses, and it very rarely occurs on permanent pastures. Between the two we practically find a line of demarcation.

The disease takes its name from the fact that it appears amongst horses in late spring and early summer, shortly after they have been turned out to grass. The first cases occur as early as April, but the great majority occur toward the end of May and throughout June and July. The incidence of the disease gradually falls, and by the end of September it has practically disappeared. It is, therefore, a seasonal disease. A few typical cases have, however, been met with in horses which are fed on hay during the winter months.

There is little doubt that the disease is of comparatively recent introduction into this country. The senior practitioners in affected areas assure us that they have never met with cases until a few years ago, although Robertson, according to Hoare, described a similar disease under the name of cerebro-spinal fever.

It is practically certain, however, that this disease of horses has been known and recognised for many years in various parts of the world, although the true cause was not elucidated. In America it was first designated forage poisoning, and outbreaks were reported in New York State as early as 1850. Extensive outbreaks have been reported in Egypt and Merseburg, while in Austria and Germany a similar malady termed Borna disease has been described by Huytra and Marek. It has likewise been recognised in France.

In more recent years a great deal of investigation has been done into the nature of this disease both in America and in Canada.

In these countries it occurred mostly in horses which were fed on ensilage, and it was American and Canadian observers who first showed that there was a very close relationship between forage poisoning and botulism. In 1916, Buckley and Shippers were able to produce by the injection of the toxin of *B. botulinus* a condition which closely resembled forage poisoning, while two years later Graham and Breuckner isolated the *B. botulinus* from toxic forage, and reproduced the disease by administering the toxin of the organism by the mouth. Last year, Mitchell was able to prove the causal relationship of *B. botulinus* to forage poisoning of horses in Canada, and showed that the organism belonged to the "A" Type.

In Australia, Seddon, of the University of Melbourne, isolated an organism closely resembling *B. botulinus* from cases of forage poisoning in cattle. He named the organism *B. parabotulinus*. In cattle, however, the disease shows a somewhat different train of symptoms to those found in Grass Sickness in horses.

The first investigations which were done in Scotland with a view to ascertaining the cause of the malady were carried out by the late Professor Dewar with the assistance of the veterinary practitioners in Forfarshire. They worked practically exclusively on clinical lines, and came to the conclusion that the disease was probably due to poisoning from a particular variety of clover, and seeing that the cases occurred almost entirely in horses feeding on grass, there were fairly good grounds for this assumption. It was because of this belief that, when the Highland and Agricultural Society took up the matter, it was referred to their chemist, Dr. J. F. Tocher, and their botanist, Professor McAlpine, to make further investigations into the nature of the pastures. They made a very complete survey of the various grasses and clovers on infected farms, and particular attention was given to alsike clover. Dr. Tocher, however,

* Presented to the Midland Counties' Division at Leamington on August 31st, 1923.

found that extracts of this clover contained no toxic property, and horses fed on an area of ground which had been sown out with a heavy seeding of this clover suffered no ill-effects. From these experiments he felt justified in discontinuing this particular line of investigation. Experiments were also undertaken to exclude the possibility of purely chemical poisoning, and the investigators came to the conclusion that the research must be pursued along bacteriological lines.

In 1919, Dr. Tocher and his son, Dr. J. W. Tocher, were able to isolate from the bowel wall, and subsequently from the spleen, of cases of Grass Sickness, an anærobic bacillus, which was morphologically identical with *B. botulinus*, and at that time the American work on this disease was unknown to them. They cultivated the organism and found that it produced an extraordinary potent toxin which, when inoculated into laboratory animals, caused death in from 18 to 24 hours. A long series of subsequent experiments enabled them to draw the conclusion that *B. botulinus* was the causal agent of Grass Sickness.

The *B. botulinus* was first isolated, and proved to be the cause of Botulism, by Van Ermengem in 1896, while he was engaged in investigating an outbreak of sausage poisoning. The name botulinus is derived from the Latin word *botulus*, a sausage. It is one of the larger bacilli, but is very variable in size, and measures from 4-9 *microns* in length. It is slightly rounded at the ends, and is flagellated and can move in suitable surroundings. It is a spore-bearing organism, and the spores appear at, or very near, the end of the bacilli. It is extremely difficult to obtain a pure culture of the organism, as it is nearly always found along with *B. sporogenes*, and, as the spores of the latter are almost as difficult to destroy as those of *B. botulinus*, it is almost impossible to get pure cultures. As is now well known, the cultivation of anærobic organisms in general is a matter of considerable difficulty, as it is not easy to obtain strictly anærobic conditions. Within recent years, however, more suitable methods have been devised. It is a gas-producing organism, and the smell is characteristic and resembles that of butyric acid.

During growth the bacillus produces a most potent toxin, which permeates the medium on which it is cultivated. The potency of the toxin is extraordinary, and the fatal dose for a guinea-pig, weighing 250 grammes, according to Muir and Ritchie, has been ascertained to be ·0005 ccs. of the filtered toxin.

Fortunately, from the point of view of food poisoning in man, the toxin is easily destroyed by heat, a temperature of 80° C. being sufficient to destroy it, while it is also destroyed by alcohol.

Up to recent times the *B. botulinus* was considered a strict saprophyte, and it was believed that botulism could only result from the ingestion of food impregnated with the toxin. The belief was held that the bacillus could not multiply in the tissues. Early in the investigation, however, Dr. Tocher was able to produce a condition resembling chronic botulism in laboratory animals by the inoculation of washed spores of *B. botulinus*, and was forced to the opinion that multiplication of the organism in the body tissues could take place. Dr. F. K. Meyer, of the University of California, in the *Journal of Infectious Diseases*, December, 1922, has clearly shown that toxin-free spores of the *B. botulinus* do germinate and multiply in the fluids and tissues of the animal body, and there produce their toxin.

It has now been shown that there are two distinct types of the bacillus, designated Type "A" and Type "B," and there are also various strains of these. There is a difference in the toxin produced by the two types, and it is the Type "A" organism which is responsible for the causation of Grass Sickness.

A matter of great importance is the resistance of the spores of the bacillus. Meyer has shown that the maximum resistance of the spores to moist heat in the laboratory is five hours at a temperature of boiling point.

The *B. botulinus* is a soil organism, and as the result of the examination of soils from different parts of the world, Meyer has been able to show that it is present in samples of soils from almost every country. Sixty-four samples of soil were examined from England and only five were found to contain *B. botulinus*.

Origin of the Disease.

No one has, up to now, dealt with the origin of Grass Sickness as far as Britain is concerned. Here one is on uncertain ground, and it is only possible to make certain logical deductions, for as yet we have no direct proof as to its origin. I have already stated that it is a general belief that the disease is comparatively new to Britain, and that it has been introduced in some way from abroad. The disease does not appear to be contagious. One horse out of four or five, living under exactly the same conditions, will contract Grass Sickness and die, while the others remain unaffected. Again, the distribution of the disease is a random one. It does not pass from farm to farm where there has been direct or indirect communication, but often appears on farms widely separated. Its occurrence is very largely confined to horses grazing on recently-sown artificial pastures. From those facts one may reasonably suppose that the disease is being introduced and spread by some agent in general use by farmers pursuing this method of cultivation. The methods by which most artificial manures are manufactured are such as to destroy pathogenic organisms. Untreated crushed bones are an exception, but they are not widely used. Artificial feeding stuffs may likewise be ruled out of count, as they are only rarely fed to horses on grass. I have a strong feeling that the spores of the *B. botulinus* are being introduced by grass and clover seeds grown on affected land in countries where the disease is prevalent, in somewhat the same way as anthrax is imported by cotton seed. During the last 10 to 15 years large quantities of various grass and clover seeds have been annually imported into Britain with the object of

improving temporary pastures. Denmark, France, Switzerland, Italy, Germany, Canada, United States, Chili, and Brazil all export grass and clover seeds to Britain, and as the disease is prevalent in some of these countries, it is highly probable that the infection is being introduced in this way.

Predisposing Causes.

This subject has scarcely been touched upon by previous writers, but again little definite can be said. Horses of all ages are susceptible to the disease. I have seen it in horses from 1 up to 20 years of age. It does not appear to affect a foal sucking an affected dam. The disease is much more prevalent during a dry season than during a wet one. The periodic rains would have the effect of washing back into the soil the spores brought up by the growing grass. One would likewise presume that there must be some abnormal conditions present before the organism could penetrate the wall of the gastro-intestinal tract. Horses grazing at leisure on pastures ingest a greater volume of food than when fed in the stable. This must obviously cause distension of the stomach and bowel wall, a fact which is quite obvious when one notes the general distension of the abdomen of a horse which has been at grass for a few weeks. This distension, accompanied by the effects of dew and frost in the morning, may be important predisposing factors in the causation of Grass Sickness.

Symptoms of the Disease.

I have already dealt with the symptoms of this disease elsewhere. We meet with two distinct types, (*a*) the acute form, and (*b*) the sub-acute form, and those two types are markedly different. Usually the first symptom to be noticed is that the horse is somewhat dull and listless, and is, as has aptly been described, apathetic. An examination at this stage reveals practically nothing to the practitioner, but usually slight fibrillary twitchings can be observed on the skin over the shoulder muscles and behind the elbow joint. One of the first distinctive symptoms is a profuse flow of saliva from the mouth and a discharge from the nostrils, and this is followed by a progressive and extreme difficulty in swallowing either food or water. The animal makes attempts to chew food and to drink water, but the power of swallowing these becomes completely abolished. The eye is dull, and the pupil is somewhat dilated, and there is usually some evidence of ptosis. By this time the fibrillary twitching of the skin and muscles over the shoulder is quite apparent, and is a constant and marked feature of the disease. The twitching is also noticeable on the muscles of the thigh. Pain is not a prominent symptom of the disease, one might rather term it an uneasiness. There is, however, more or less profuse patchy sweating over the body, and a very distinctive feature is the presence of a soapy sweat underneath the tail. The breathing of a horse suffering from Grass Sickness is also very characteristic. There is a soft but audible snore in both types of the disease. Another distinctive symptom, especially in the acute cases, is a complete impaction of the bowel. If a rectal examination be made, the colon is found to contain an extremely hard and immovable mass of accumulated fæces. The contents of the rectum are very sticky, and adhere to the arm like glue. The animal seems to be hungry and thirsty, and will attempt to eat a mouthful of food and to drink a mouthful of water, but both the food and the fluid remain in the throat, and their presence there sets up a vomiting movement, and the material is ejected from the nostrils. When this occurs, the animal sometimes emits a peculiar squeal. There is no interference with the voluntary muscles of the body, and no cerebral excitement. Throughout the illness there is usually little or no rise of temperature, the pulse is lacking in tone, and towards the end is very irregular. The illness in the acute case lasts from two to five days, and death is due to paralysis of the heart and respiration. The mortality in the acute cases is practically 100 per cent.

In the sub-acute or chronic form most of the characteristics of the acute type are present, but in a less degree. Salivation and nasal discharge is also profuse, and though swallowing is extremely difficult, it is not entirely suspended. The animal is able to swallow small quantities of food provided it is moist, but has great difficulty in swallowing dry food. Mastication is extremely slow, and a proportion of the food drops from the mouth. The impaction of the colon is not complete, although severe constipation is present in most cases. Horses suffering from the sub-acute form may live for weeks or months, and although the power of swallowing improves, digestion and absorption seem to be seriously interfered with, as the patient gradually wastes away, and ultimately the abdomen becomes so " tucked up " as to produce the appearance which has been aptly described as a " greyhound appearance." A noticeable feature in the chronic case is a board-like hardness of the muscles of the loins and of the croup. There is also a marked drooping of the croup, forming an angle with the line of the back of about 45 degrees. Snoring in the sub-acute case is often very marked, and on *post-mortem* examination food material is usually found lodged in the nostrils. A very small number of the chronic cases recover, but convalescence is very prolonged, and it is sometimes a year before they are able to do any work, so that very often they are destroyed, as the owner finds it is not an economic proposition to continue to treat them.

The symptoms of Grass Sickness are the result of paralysis of the vagus or tenth cranial nerve, which arises from the floor of the fourth ventricle. The paralysis results from the effect of the toxin of the organism. The vagus is in direct communication with the sympathetic system, and it may therefore be said that the nerve supplies the main motor fibres to all parts of the alimentary tract. The vagus also provides branches to the lungs, heart and abdominal vessels. Paralysis of this nerve would therefore produce symptoms of difficulty in swallowing, paralysis of the intestinal tract, dilitation of the blood vessels, hypostatic congestion, and finally cardiac

and respiratory failure, and these are the main symptoms of Grass Sickness.

Post-Mortem Appearances.

The *post-mortem* appearances in Grass Sickness are comparatively few, but somewhat characteristic. In the acute case the abdomen is naturally full and tense owing to the extraordinary impaction of the colon with food material. The contents of the colon in particular are very hard, and the dry masses of food material are difficult to disintegrate. The ingesta is very adherent to the mucous membrane, and it is with difficulty that it can be freed from the lining of the bowel. The lining itself is easily stripped off. The bowel wall itself is very flaccid, and in a sodden condition, and throughout its whole length there are well-marked hæmorrhagic patches which are of a hypostatic nature—venous congestion. When the animal is bled to death this congestion very largely disappears. The liver, spleen and kidneys are also congested, but in the acute case there is no enlargement of the spleen. If the brain be removed, the cerebral vessels will be found to be markedly engorged with blood.

In the sub-acute case which has lingered for some weeks there are additional features to be noted on *post-mortem* examination. The contents of the bowel are of a more pultaceous nature, and the amount of fæcal matter is very small in comparison with what is found in the acute case. A distinctive feature in every case is a variable enlargement of the spleen. Sometimes it reaches 20lb. in weight. It is fairly firm, however, in consistence, and dark chocolate in colour. Another prominent symptom is noticeable in the naso-pharynx and the brain. The nasal mucous membrane is markedly engorged, and more or less food is usually found in the nares. The presence of this food usually causes ulceration and necrosis of the mucous membrane and of the ethmoid bone, and in this way infected material can pass along the olfactory nerve into the brain itself. This sets up an inflammatory condition of the meninges, which are usually found thickened. Petechial hæmorrhages are also seen in the brain substance. In the chronic case there is usually an excess of cerebro-spinal fluid. These symptoms are considered to be due to the infection which has extended from the nostrils along the course of the olfactory nerve.

Diagnosis.

The diagnosis of Grass Sickness is not always easy, especially in the acute case. The four symptoms of importance are—the salivation and inability to swallow, the complete impaction of the bowel, the fibrillary twitching of the muscles, and the soft but audible snore in breathing. With those conditions present there should be little difficulty, but they are not always all present in a marked degree.

There are several conditions which are liable to be confused with Grass Sickness. The principal ones are impaction of the stomach and bowel, volvulus or twist—in fact, most of the conditions that come under the general heading of colic. All these have been frequently mistaken for grass disease.

In some parts of the country the death of almost every horse at grass has been ascribed to Grass Sickness, whereas we know that there was a considerable death rate amongst horses at grass from various digestive troubles long before Grass Sickness made its appearance. It is often very difficult to differentiate between the acute form of this disease and various types of lingering colic where the pain is not very acute. On one occasion I made six *post-mortem* examinations in two days on supposed Grass Sickness cases, and only one proved to have died of that disease. We also sometimes hear of acute cases recovering rapidly, like an acute colic. Such cases are not grass disease. In my experience, all acute cases either die or merge into the sub-acute form.

Treatment of the Disease.

In the early stages of the investigations into the nature of this disease, veterinary surgeons devoted their attention to the principal lesions which were apparent from clinical and *post-mortem* examination. One outstanding symptom was the acute impaction of the bowel. Treatment was directed to the relief of this condition. Purgatives of all kinds were used in order to try to empty the impacted colon. Aloes, linseed oil, and saline purgatives were all tried in very large doses, but without effect. Large quantities of water, containing salines, have been introduced by means of the stomach pump, but without any beneficial result. Powerful evacuants, such as eserine, pilocarpine and arecoline hydro-bromide, were administered in large doses, but without success. The usual alimentary stimulants and tonics, such as carbonate of ammonia, nux vomica and other stomachics, also proved ineffectual. In fact, the veterinary medicaments in ordinary use all proved entirely futile.

Further investigation had, by now, led Dr. Tocher to the belief that the *B. botulinus* was the causal organism in Grass Sickness, for the following reasons: (1) He was able to isolate the *B. botulinus* from every case of Grass Sickness examined; (2) he was able to produce the clinical symptoms and *post-mortem* appearances of Grass Sickness in experimental animals, and also in horses by means of toxin elaborated in "grass sickness" botulism cultures. The injection of large doses of washed spores of *B. botulinus*, freed from the toxin, obtained from cases of Grass Sickness, produced symptoms resembling Grass Sickness when inoculated into the abdominal cavity of laboratory animals; (3) Professor J. B. Buxton, F.R.C.V.S., was able to show that the blood serum of horses suffering from the sub-acute form of Grass Sickness had the property of neutralising the toxin produced by *B. botulinus* obtained from an external, that is to say, "non-grass sickness" source. Blood serum of normal horses had not this property.

Immunology.

When Dr. Tocher had reached the conclusion that the *B. botulinus* was the causal agent in Grass Sick-

ness, and when ordinary medicaments proved futile in the treatment of the disease, he realised that the only possible successful course was to try the efficacy of bacterial products made from this organism. He was fortunate in securing the whole-hearted interest and co-operation of Professor J. B. Buxton, who, early in 1921, prepared a botulinus anti-toxin which was to be employed chiefly for curative purposes. It was realised, however, that in view of the close similarity between the *B. botulinus* and the *B. tetani*, both as regards their biological characters and the behaviour of their toxins, an anti-toxin might have very feeble curative properties, and might only produce in healthy animals a very transient passive immunity. This anticipation proved to be correct. The curative value of the anti-toxic serum was no greater than that experienced in the treatment of tetanus. When used very early in acute cases, and administered intravenously, and also in sub-acute cases, it undoubtedly checked, to some extent, the acute symptoms, but the effect was transient. As a prophylactic the anti-toxin was not a success. The passive immunity produced by inoculation of the anti-toxin was shown to exist only for a period of about ten days. The unsatisfactory results obtained from the use of botulinus anti-toxin prompted the investigators to attempt to produce an active immunity in horses by means of a toxin-anti-toxin mixture over-neutralised by 50 per cent. This is a modern bacteriological method of conferring an active immunity, and has been used successfully against diphtheria and tetanus. The reason for this high over-neutralisation was to protect the animal from any possible effects of so potent a toxin.

In a carefully-conditioned experiment some 961 horses were inoculated with this mixture, while a similar number were left uninoculated on the same farms. The death rate amongst the uninoculated horses on the farms where inoculations took place was 9·3 per cent., while the death rate among the inoculated horses on the same farms was 2·8 per cent. There was thus a reduction of 6·5 per cent. in the death rate, a result attributable to the inoculation.

A similar experiment has been carried out this year with a toxin-anti-toxin mixture over-neutralised only to the extent of 10 per cent., which, by careful experiment, was proved to be quite safe. I had hoped to be able to give you the results of its use, but it has not been possible to have the figures collected, but, so far as we can gather, the death rate amongst horses inoculated with this year's preparation is much smaller than last year.

The toxin-anti-toxin mixture used in 1922 was prepared from a known strain of *B. botulinus*, in order to see whether such a specific known substance would protect horses against the disease or reduce the mortality incidence. If it did so, it was an additional proof that Grass Sickness was identical with botulism. The toxin-anti-toxin mixture used this year was made from strains of *B. botulinus* isolated by Dr. Tocher and Professor J. B. Buxton from horses which had been killed while suffering from the chronic form of the disease.

Discussion.

Mr. H. J. Dawes (Hon. Secretary), in opening the discussion, said he would first like to thank Mr. Brown for his kindness in coming amongst them that day, and especially for supplying them with a paper in advance, which had been printed and circulated among the members. Grass Sickness was a very important disease, which, although it had not yet found its way into this country, was on the increase in Scotland, and sooner or later they would meet with it in the Midlands. In fact, in Professor Wooldridge's book on Veterinary Medicine, there was an account of a case in Essex presenting similar symptoms to those of Grass Sickness, and the report of one or two cases had appeared in the *Veterinary Record*. He (Mr. Dawes) did not know much about the disease personally, but a friend of his in the centre of the trouble had written to him about it. His friend had had 40 deaths up to the present, and seven or eight animals were in a chronic condition. With several of the Examiners of the R.C.V.S., he had an opportunity of seeing a case of chronic Grass Disease at the Glasgow Veterinary College, and the symptoms were very different from anything he had seen before. They reminded him of a case of sub-acute tetanus. He paid a tribute to the work of Dr. Tocher and Professor Buxton, but he said he was rather surprised that Mr. Brown had not referred in his paper to the work of Professor Gaiger on the subject. The occasion on which he saw the case mentioned was when Professor Gaiger gave an address on the cause of the disease. Considering the responsible position which Professor Gaiger held in Glasgow, he thought the paper should have included an account of the work done by Professor Gaiger in connection with the disease. Professor Gaiger's opinions differed from those of Dr. Tocher and Professor Buxton in that he thought the cause of the disease was a diplostreptococcus, and that the disease was similar in symptoms to "Borna disease," described in Wallis Hoare's book, but Professor Gaiger was very guarded in his remarks. Mr. Brown attributed the mischief to the *Bacillus botulinus*, and he would like to ask whether that view was accepted by practitioners generally in Scotland. He further wished to enquire whether the injection of anti-toxins had been successful, and if there had been any deaths as a result of the injections. Also he would like to know if it was used in Grass Sickness as a curative or as a preventative. He also desired to be informed if the disease had been produced experimentally in the horse by the injection of a toxin. He understood that a similar disease had been produced in laboratory animals. Was this disease the same as forage poisoning in America? At the conclusion of his remarks, Mr. Dawes passed round a couple of photographs of a horse suffering from the disease, in which some of the symptoms described by the essayist were very marked.

Mr. Brooke said he was thankful that in the Midlands the disease was practically unknown, but it was a good thing to hear it described so lucidly by Mr.

Brown, because they never knew what was in store for them. The general evidence seemed to be that the *Bacillus botulinus* was the organism that caused the disease, and the fact that it was a soil-born organism made it difficult to eradicate. As prevention was the main thing, he thought disinfection of the pastures and the prohibition of imported grass seeds were matters of importance.

Mr. McLauchlan said he would not be too sure that there was no Grass Sickness in the Midlands. He felt sure that he had had a typical case. He did not realise what was wrong with the animal at first. He thought it was choking, whilst the other symptoms were similar to those Mr. Brown had described. The owner shot the horse, and when it was opened the spleen was found to be affected.

Mr. Ison corroborated what Mr. Dawes had said with regard to the Glasgow case, which they saw together. He wondered whether, as the *Bacillus botulinus* was a widespread bacillus in many soils, it was possible to get the same trouble in other animals without these showing quite the same symptoms that occurred in the horse. Mr. Pemberton had trouble with some Hereford cattle, and it was the opinion of one expert that it was probably due to some anærobic organism. It may have been the *Bacillus botulinus* without the symptoms following the same course as they did in the horse.

Mr. H. W. Dawes said they were very much indebted to Mr. Brown for giving them the fruits of his investigation. Fortunately, from the general practitioner's point of view, grass disease had not made its appearance in that district, and in view of the large amount of permanent pasture that existed in the Midlands, it was doubtful whether they would ever get much of it. It seemed to be established that Grass Sickness was largely associated with the laying down of artificial pastures. There were points in Mr. Brown's paper that were of interest even to those who knew nothing of the disease. First, there was the presumably-established connection between forage poisoning in America and Grass Sickness in Scotland, but the clinical reports of the two conditions required a certain amount of approximating. The American journals seemed to lay emphasis on the fact that forage poisoning was largely a disease of the winter months, and cut clover and similar foods were looked upon with suspicion. That fact and the seasonal incidence of Grass Sickness in Scotland (which occurred usually in the early spring) wanted reconciling a little more than Mr. Brown had done in his paper. As to the bacteriology of the *Bacillus botulinus*, certain symptoms were due to toxic influence on the vagus nerve. The toxin was supposed to have a predilection seat in the vagus nerve. Had it ever been traced to any other portion of the cerebral tissues? The amount of knowledge still to be acquired with reference to this disease was a fitting support to Dr. Bradley's plea for funds to establish research scholarships at the principal training centres.

Mr. Banham said he had a case which seemed to resemble Grass Sickness, except that instead of too much saliva there was too little. In a few days the animal got into a comatose state, standing with his head in a corner. He lived about eleven days in that condition. The trouble was attributed to deadly nightshade, to which the animal had access.

Colonel Walker said he had read Mr. Brown's paper with great interest. He might be expected to tell them something of his experience in India, extending over 30 years, in regard to this disease. He could not say very much, however, because pastures in India practically did not exist, and animals were lucky to be fed on forage. They were mostly fed on dry grass and grain of sorts. He remembered a good many years ago a small pasture was put down with some English seeds. Amongst this pasture when it grew was a considerable amount of white clover. He fed his own pony on this, and it developed the preliminary symptoms of Grass Sickness. A good many of the symptoms were such as Mr. Brown had described, and it was no doubt due to feeding the pony on the green white clover. He mentioned that as showing that white clover in certain conditions had some influence in causing this disease. The pony got well again when taken off the pasture, and none of the subsequent symptoms described by Mr. Brown occurred. He was not competent to say anything about the pathology of this disease, because it had only recently been brought to his notice, but it struck him that they were not on very sure ground. He said that because of his acquaintance with hæmorrhagic septicæmia, which was a disease well known in India. The organism was found in the blood stream and it was a seasonal disease causing symptoms which might possibly lead to a mistaken diagnosis.

Mr. De Vine said he had never seen a case of Grass Sickness in the Midlands, and he hoped he never would, but he could not, as an officer of that Association, refrain from thanking Mr. Brown for bringing the matter before them in the clear and intelligible way in which he had.

Mr. Aston also admitted that the disease was unknown to him, but, after reading the paper, he had come to the conclusion that the mysterious outbreak which Mr. Pemberton had to deal with was hæmorrhagic septicæmia.

Dr. Bradley said the subject was not one on which he could speak with any authority, but he thought, in regard to Grass Sickness, as was the case with many other diseases, there was a third partner in the case. The animal might be able to resist the organism in some circumstances, but there might be an active third partner which assisted the organism, and it might be well to give some attention to the discovery of that third partner.

Mr. Aston, following up the last speaker's point, said a chill or parturition might be the third partner that gave power to the organism which of itself might not do much mischief.

Mr. Slipper referred to a case in his experience where the animals had been fed on clover, bran, oats

and some mixture of grains. Three horses were taken bad, much salivated, anxious to eat, but unable to do so, chewing food which they were unable to swallow. In three days one got down and died, and two days later another did the same. It occurred to him that the symptoms presented in those cases were due to some such organism as the *Bacillus botulinus*.

The Reply.

Mr. Brown, replying to the discussion, thanked the meeting for the reception given to his paper. He might have written even more extensively, but so much had already appeared in print with regard to this mysterious disease that he thought a brief outline would suffice. He was repaid for any trouble he had been put to by the very interesting discussion which the paper had provoked.

First of all, with regard to the criticism by Mr. Dawes, he would not like anyone to think he had been disrespectful to such a distinguished member of the profession as Professor Gaiger, but Professor Gaiger had not as yet given them very much to go upon, and he (the speaker) had confined himself to what he believed to be established facts. It was only in recent times that they made discoveries of real importance and been able to differentiate between Grass Sickness and some other diseases. He agreed with Mr. Dawes that there was not much difficulty in diagnosing a chronic case of Grass Sickness, but in an acute case it often was very difficult. If one only saw one case it would be easy to make a mistake, and one required to see a good many cases and to be fairly well acquainted with the disease to make a correct diagnosis in the very early stages. In chronic cases, when wasting had begun, there was little chance of error. That was why he believed the disease to be a new one, so far as this country was concerned, because their forefathers were very observant men and would have noticed the symptoms of grass disease if it had existed. There were no records, however, of such a disease having been observed by former generations. As to whether it was due to the *Bacillus botulinus* was an open question with some practitioners. Some people thought that it was, and some thought differently, and it was a difficult subject to discuss, because it led them into the abstruse science of bacteriology, in which very few of them had specialised. He gave the results of certain experiments that had been conducted this season, showing that the death rate was less than ½ per cent. among animals that had been inoculated, whilst among non-inoculated animals it was over 9 per cent. He had been asked whether the injection was harmful. It was said to have given rise to cerebral excitement in the nature of staggers in a number of horses, but so far as his experience went these symptoms did not show themselves at once, which he thought must have been the case if there had been anything deleterious in the injection itself. These symptoms did not appear until one to two months after the inoculations. As to whether there was any connection between Grass Sickness and the forage poisoning of America, it had been shown that so-called forage poisoning in America was due to the *Bacillus botulinus*, but there was a difference. In America, animals were supposed to be poisoned through eating ensilage. The temperature in the silo was sufficiently high to enable the bacillus to produce toxin. It was different in Grass Sickness. They could not imagine the *B. botulinus* producing a toxin in the soil under ærobic conditions. That was one of the chief difficulties in the course of the investigation, because it was believed that this organism could not multiply in the tissues; but Professor Meyer, who was examining soils from all over the world, had established the fact that the *B. botulinus* did multiply and produce this toxin in the system. The *B. botulinus* behaved, biologically, very much like the *B. tetani*. They had been able to produce in the horse all the symptoms of acute Grass Sickness by the inoculation of toxin derived from the spleen of a horse killed while suffering from the chronic form of the disease. Regarding the precise action of a toxin-anti-toxin mixture, its action was principally protective. Only in a chronic case would it have some curative effect. The excess of antitoxin in the over-neutralised mixture would produce a short passive immunity after a time. The belief was that the toxin-anti-toxin molecule got split up in the tissues. Toxin was slowly liberated and acted as an active immunising agent. Mr. Brooke had suggested the disinfection of the pasture, but it was the most difficult spore of any to kill. It would resist prolonged heating at high temperatures, and altogether there was not much hope of disinfecting a pasture when once it had become contaminated by spores. Mr. McLauchlan's case seemed to be one of Grass Sickness, showing all the symptoms connected with the disease. As to whether it affected any other animal besides the horse, as far as it was known it only affected the horse, but human beings, poultry and pigs were susceptible to the toxin. It did not affect cattle, but in Australia a similar disease had been discovered, due to an organism closely allied to the *B. botulinus*. He was interested to hear Colonel Walker say that possible cases had occurred in India from seeded grass. He (the speaker) thought it was pretty well established that the disease was closely associated with artificial pasture. In Scotland, there was generally some history of the horse having been fed on artificial pasture. As for hæmorrhagic septicæmia, there had been a number of outbreaks at one time or another, and it generally came in a very dry summer when there had been very little grass. In reply to Mr. Slipper, the salivation was due to the inability of the animal to swallow the saliva owing to paralysis of the pharynx. The absence of peristaltic movement in the œsophagus was evidenced by the difficulty in passing the stomach tube as compared with a normal animal. It required a little force to pass the tube to the stomach. In conclusion, he re-echoed the wish of many of the speakers that Grass Sickness might not show itself in the Midlands.

"National" Lead Followed.

County Councils' Association and Tuberculin.

It is gratifying to note that the efforts made by the N.V.M.A. to focus attention upon the question of the restriction of the sale of tuberculin are meeting with success.

The *Official Gazette* of the County Councils' Association gives the following, in the course of the report of the Agricultural Committee :—

"The Committee considered the following resolution received from the Northumberland Diseases of Animals Sub-Committee in regard to the supply of tuberculin :—

"With a view to the prevention of fraud in the use of tuberculin, the Sub-Committee recommend that (as in the case of mallein) it be supplied only to members of the medical and veterinary professions from authorised laboratories.

"It was *resolved*—

That the resolution submitted by the Northumberland Diseases of Animals Sub-Committee be approved and forwarded to the Ministry of Agriculture and Fisheries."

The "Cruelty" Chaos.

"Royal Commission" and "Veterinary Board" Suggestions.

A plea for some measure of standardisation of ideas on the part of those concerned in cruelty to animals cases—stockowners, veterinary surgeons and societies—as to what constitutes cruelty to animals is put forward in the *Belfast Telegraph*, by Captain J. R. Gregg, M.R.C.V.S., of Belfast, in a letter, from which we abstract the following :—

"The time is due, if not overdue, when the facts of the differences which exist between the above, as to what constitutes cruelty to animals, and how the law relating to the same may be administered, should be made public in the Press, and, if 'the community is sufficiently interested,' inquired into by a Royal Commission.

"As a rule stockowners assert that they do not wish to be cruel to their stock, if a better way of handling them can be found, and owners of work animals say that they give them as good a time as they take for themselves and their families. They say further that they send their children to work if lame from a corn or a tight boot, or suffering from cuts of the fingers, or other like accidents that hurt them every time they use a tool, and they are not fined for cruelty. Yet if they attempt to work a horse suffering in a similar way, they are pulled before the Court and fined.

"The case for the humanitarians has been frequently well put by members of the local society, and by the Marquis of Dufferin. He, however, neglected to say how an animal was to be put on a ship if it refused to go in the required direction.

"But why should he not suggest to our farmers to train their calves as is done on the Continent, and so do away with the shouting and belabouring drovers? Such cattle will follow their attendant almost anywhere he leads them, and without showing any sign of excitement. I am sure the new Minister of Education would arrange for lectures to be given in the rural schools on similar lines to those given to the Boy Scouts.

"We claim that veterinary surgeons are as humane as any other body of men who handle animals or human beings in bulk. As things now stand the veterinary surgeon comes in for a lot of misrepresentation and abuse. In the first instance, the unpractical enthusiastic humanitarian who can only see through one hole calls him a 'heartless man' if he cannot see his way to give evidence against some supposed cruel person. On the other hand, if he gives evidence against a practical horseman, he is looked upon by those 'that know' as the supporter of old woman's fads, and occasionally he is even called a perjurer.

Need to Review Mode of Trial.

"If the Royal Commission ever sits, it will require to review the mode of trial in cruelty cases. Our view is that, instead of veterinary surgeons being heard for and against in disputed cases, the magistrates should refer such cases to a Veterinary Board appointed by the bench. No one disputes the fact that the veterinary surgeon is the only person who can properly assess the amount of pain an animal is suffering from any given cause or the amount of punishment it should receive to persuade it to do our bidding. This knowledge impels the veterinary surgeon to give proper consideration to the animals' point of view when considering an offence committed by its owner.

"The Department with which we were connected during the war (the R.A.V.C.) was considered by some to overstep all economical laws in its desire to prevent the future suffering of horses and mules. We can only speak from first-hand knowledge of what took place in the U.S.A. and Egypt. Animals with slight impediments were destroyed rather than run the risk of letting them fall into the hands of persons who might not have the judgment to work them within the extent to which they were capable. In Egypt we have seen £30 and more being offered for an animal which was afterwards killed on humanitarian grounds. Those who witnessed our actions in the war would be the last to say that we, as a profession, are inhuman. We appeal, in conclusion, to all lovers of animals to trust the Veterinary Profession, and to get together round their local branches of the Society for the Prevention of Cruelty to Animals, and help them (1) to study the point of view of the animal owners; (2) to educate that point of view away if it is wrong, by using the methods of the present-day Christian missionary rather than the extinct methods of Cromwell."

Symbiosis in Animals and Plants.

Professor George H. F. Nuttall, M.D., Ph.D., Sc.D., F.R.S., President of the Physiology Section, discoursed at the recent British Association Congress on the above subject, describing examples of symbiosis in lichens, root nodules of leguminous plants, the significance of mycorrhiza in (*a*) orchids, (*b*) origin of tubers in various plants, (*c*) Ericaceæ and club-mosses and ferns, symbiosis in animals and insects, and micro-organisms in relation to luminescence in animals: (*a*) luminescence due to parasitic organisms, (*b*) luminescence due to symbionts in insects, cephalopods, tunicates (Pyrosomidæ), and fish, together with an exposition and discussion of Portier's hypothesis. The author concluded as follows:—

The term "symbiosis" denotes a condition of conjoint life existing between different organisms that in a varying degree are benefited by the partnership. The term "symbiont," strictly speaking, applies equally to the partners; it has, however, come to be used also in a restricted sense as meaning the microscopic member or members of the partnership, in contra-distinction to the physically larger partners which are conveniently termed the "hosts" in conformity with parasitological usage. The condition of life defined as symbiosis may be regarded as balancing between two extremes—complete immunity and deadly infective disease. A condition of perfect symbiosis or balance is realised with comparative rarity because of the many difficulties of its establishment in organisms that are either capable of living independently or are incapable of resisting the invasion of organisms imperfectly adapted to communal life. In these respects the conclusions of Bernard and Magrou in relation to plants apply equally to animals. It is difficult to imagine that symbiosis originated otherwise than through a preliminary stage of parasitism on the part of one or other of the associated organisms, the conflict between them in the course of time ending in mutual adaptation. It is, indeed, probable that some supposed symbionts may prove to be parasites on further investigation. In perfect symbiosis the associated organisms are completely adapted to a life in common. In parasitism the degree of adaptation varies greatly; it may approach symbiotic conditions on the one hand, or range to vanishing point on the other by leading to the death of the organism that is invaded by a highly pathogenic animal or vegetable disease agent. There is no definite boundary between symbiosis and parasitism. The factors governing immunity from symbionts or parasites are essentially the same.

No final conclusions can as yet be reached regarding the function of symbionts in many invertebrate animals owing to our ignorance of the physiological processes in the associated organisms. The investigation of these problems is one fraught with difficulties, which we must hope will be surmounted. New knowledge is continually being acquired, and a glance into new and even recent publications shows that symbionts have been repeatedly seen and interpreted as mitochondria or chromidia. Thus in *Aphis* the long-known pseudovitellus has been shown to contain symbiotic yeasts by Pierantoni and Sulç, independently and almost simultaneously (1910); Buchner (1914) has demonstrated symbiotic luminescent fungi in the previously well-studied pyrosomes, besides identifying (1921) as bacterial symbionts the mitochondria found by Strindberg (1913) in his work on the embryology of ants. The increasing number of infective diseases of animals and plants, moreover, which have been traced, especially of recent years, to apparently ultramicroscopic organisms cannot but suggest that there may exist ultramicroscopic symbionts. From the foregoing summary of what is known to-day of symbiosis we see that it is by no means so rare a phenomenon as was formerly supposed. Symbiosis occurs frequently among animals and plants, the symbionts (algæ, fungi, bacteria) becoming in some cases permanent intracellular inhabitants of their hosts, and at times being transmitted from host to host hereditarily. Among parasites non-pathogenic and pathogenic, we know of cases wherein hereditary transmission occurs from host to host. It is evident that we are on the threshold of further discoveries, and that a wide field of fruitful research is open to those who enter upon it. In closing, it seems but fitting to express the hope that British workers may take a more active part in the elucidation of the interesting biological problems that lie before us in the study of symbiosis and the allied subject of parasitism.—*Pharmaceutical Journal.*

Transition Period in Medicine.

"The opening of the medical schools this year finds the profession of medicine," says *The Times* medical correspondent, "still in that state of 'divine discontent' in which it has been labouring for close on a decade.

"There is little doubt that great changes, changes so fundamental as to be difficult to determine with accuracy, are now in progress. The minds of the profession are consequently unsettled. It is the kind of occasion which is eagerly seized on by the enemies of ordered progress to thrust forward their own special opinions or nostrums. The world was never so full of 'quacks' as it is just now, nor were these ever so vociferous. Every failure of the 'orthodox' school to cope with disease or cure it is turned to advantage.

"Yet, in fact, progress has been continuous, so that it may fairly be said that, even if emphasis has been wrongly placed in certain instances, or if some theories and explanations have been discounted, the general direction has not erred. The early work on the ductless glands, for example, though it has been assailed by foes and, too often, carried to extremes by friends, has given us insulin in this present year, and so conferred a new, immense boon on humanity. Bacteriology, too, though it has lately been developing more slowly, has resisted all attempts to discredit it. The central truths remain, though much of the theorising has passed or is passing. Out of the slough of indiscriminate and even grotesque application, the new science of vaccination—in the wide sense of that term—is at last emerging to solid ground.

"Meanwhile, the pendulum of thought has swung sharply away from the causes of disease to its effects on the human organism and to the natural means of reaction and defence possessed by the body. Vast unexplored fields, it is becoming clear, await the seeker after knowledge—not the least of which, perhaps, is the mode of action of drugs. The medical student is likely

to find that his teachers have turned insensibly towards what may fairly be called the 'science of medicine,' in contradistinction to those other sciences upon which the physician has so largely drawn in past years. He will discover a new tendency to examine symptoms and to view the body as a reacting organism constantly adapting itself to changes in its environment, and, as Professor Haldane pointed out recently, constantly impressing itself on that environment.

"There is, of course, a world of difference between the view that a symptom is something inflicted from without and the view that it expresses a form of counter-attack by the organism. So fundamental is this distinction, that its implications are only just being realised. We remain ignorant of the mechanism of many symptoms, and so of the mechanism of reaction; and this knowledge can only be acquired by painstaking physicians at the bedside. The 'science of medicine' is a branch of the 'study of man,' and so a larger humanity begins to infuse itself into the lecture hall. Scientific precision is not confined to chemistry or physics; because the methods of these sciences are not always applicable to life itself, it does not follow that the study of life must be unscientific.

"Generally speaking, the modern student is to be congratulated on beginning his studies at a moment of transition. He will come to them unembarrassed by the too sanguine hopes which characterised the beginning of the 'laboratory age'; he will be able to see clearly the limitations as well as the values of the outlook of the generation which is now growing old. The opportunity is his to make of medicine an independent science or once again to practise it as a great art. The conflict between these two activities, so often emphasised a few years ago, is unreal."

Royal Society of Medicine.

(Comparative Section.)

At a recent meeting of the Fellows of the Royal Society of Medicine, held at 1 Wimpole Street, W., with the President (Sir Wm. Hale White) in the chair, the following were elected as the officials of the section of comparative medicine:

Council: President—The Right Hon. Sir Clifford Allbutt, P.C., K.C.B., M.D., F.R.S.; Vice-Presidents—Major-General Sir Layton Blenkinsop, K.C.B., C.M.G., A.V.S., Lieut.-Colonel J. W. Brittlebank, C.M.G., D.V.S.M., R.A.V.C., Sir William Hale-White, K.B.E., M.D., Major F. T. G. Hobday, C.M.G., F.R.S.E., Lieut.-General Sir William Leishman, K.C.M.G., C.B., M.B., F.R.S., A.M.S., Major-General Sir John Moore, K.C.M.G., C.B., A.V.S., Lieut.-Colonel Sir Leonard Rogers, C.I.E., M.D., F.R.S., G. H. Wooldridge, M.R.I.A. Other members of Council—Andrew Balfour, C.B., C.M.G., M.D., Aldo Castellani, C.M.G., M.D., Stewart R. Douglas, F.R.S., L. S. Dudgeon, C.M.G., C.B.E., F.R.C.P., George S. Dunkin, D.V.H., G. Dunlop-Martin, M.R.C.V.S., W. Hamilton Kirk, M.R.C.V.S., G. H. Livesey, M.R.C.V.S., J. W. McIntosh, F.R.S.E., G. P. Male, M.R.C.V.S., Sir D'Arcy Power, K.B.E., F.R.C.S., Major-General W. Dunlop Smith, C.B., C.M.G., D.S.O., A.V.S., C. F. Sonntag, M.D., Walter G. Spencer, O.B.E., M.S., Sir William Willcox, K.C.I.E., C.B., C.M.G., M.D., Lieut.-Colonel A. J. Williams, D.S.O., R.A.V.C.; representative on Library Committee—Frederick T. G. Hobday, C.M.G., F.R.S.E.; representative on Editorial Committee—J. B. Buxton, D.V.H.

Meetings are held at 5 p.m. 1923—Wednesdays, October 24th and November 28th; 1924—Wednesdays, January 23rd, February 27th, March 26th, and May 28th (annual). Adrian Stokes, D.S.O., O.B.E., M.D., Pathological Department, Guy's Hospital, S.E.1; J. B. Buxton, D.V.H., National Institute for Medical Research, Mill Hill, N.W.7, honorary secretaries.

This section has been formed for the purpose of bringing members of the two branches of medicine into direct contact for discussion upon subjects of mutual interest in connection with human and animal diseases, and has already a membership of about 150, of whom over 70 are veterinarians. Terms of Fellowship can be obtained upon application to the secretaries of the section, or to Sir John McAlister, the general secretary, 1 Wimpole Street, London, W.1.

Mammoth Kennel Club Show.

The sixty-second show organized by the Kennel Club, which was opened at the Crystal Palace on October 3rd, drew the remarkable entry of 5,433. Many breeds not catered for at ordinary shows were included. Alsatians headed the breed entry with 436, and they were judged by the well-known continental expert, M. Hassebroucq. Speaking generally, the exhibits showed a marked improvement on previous shows. It was disappointing to find only eighty-eight entries of bulldogs, particularly as a similar falling off has been noticeable at other shows of late. Gun-dogs were well represented, and, as usual, cockers made the best entry in the section. Kerry Blues are making great strides and were as good a lot as has been seen benched for some time. The "toy" section was headed by Pekingese, but Pomeranians were disappointing in numbers, although their quality was of the best.

The R.S.P.C.A., in a memorandum, state that they are informed by the Minister of Health that the Cabinet Committee on the Slaughtering of Animals has completed its deliberations and forwarded its recommendations to the Cabinet. The Committee's report will not be published, but the Society is authorised to state that as the result of the Committee's recommendations, the Government do not propose to set up a Committee of Inquiry as to the effect of mechanical stunning instruments on meat.

The International Congress on Cattle-Breeding is now sitting at The Hague. At a sitting presided over by the Secretary of the Shorthorn Society of the United Kingdom, Mr. Seymour uttered a warning against making registers too extensive, as they were a costly business, and breeders would not consult them if they were too complicated. At another sitting, under the presidency of Mr. D. Twomey (Ireland), the Congress considered the question of milk control, and the necessity of making regulations regarding it international. The Congress adopted a resolution asking the International Institute of Agriculture at Rome to extend its operations in this respect.

The Veterinary Record.

13th October, 1923.

National Veterinary Medical Association of Great Britain and Ireland, Limited.

Cheques should be made payable to the Acting General Secretary at the Offices of the Association, 12 Buckingham Palace Road, S.W.1.

N.B.—Members receiving this paper in a brightly-coloured wrapper will please understand that their subscription is already overdue, and should be forwarded at once to the above address.

BRACKEN POISONING.

One of the most interesting problems arising in country practice during the present year has been the true cause of the outbreaks of serious and often fatal illness in stock, which have been described by several writers in our columns either under the name of bracken poisoning or of hæmorrhagic septicæmia. One is led to the conclusion that bracken plays an important part in the illness and may be the cause, either direct or indirect, as in the majority of cases it has been found in quantities in the ingesta on *post-mortem* examination; and the symptoms, in rapidly fatal cases, coincide with the symptoms of those cases in which it is known that the cattle have been gorging themselves on bracken. But we have evidence that these symptoms are those of hæmorrhagic septicæmia as seen in other parts of the world, and Major Chambers has identified an organism from the blood of cattle dead of the disease with the ***Pasteurella bovisepticus***, which is the cause of the disease in Africa. Similar evidence is obtainable from America. Though confirmatory and conclusive proof has not yet been published, we must incline to the belief that the latter explanation is the more sound, but we would like further information as to the part played by the bracken in this curious disease. Is it the presence of bracken in the stomach that makes the *B. bovisepticus* particularly virulent? Does infection with *B. bovisepticus* cause, as one of its symptoms, an abnormal desire on the part of cattle to consume bracken in quantity? Do cattle die from bracken poisoning unassociated with the infection of hæmorrhagic septicæmia? It surely cannot be that these cases are merely coincidences.

There is room here for a great deal more observation and research. Every case seen should be carefully recorded and detailed clinical notes retained. In every case possible the services of a bacteriologist should be obtained. It is only by careful clinical observation, followed and confirmed by expert laboratory examination and experiment, that cases such as these can be set definitely in their correct

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Abstracts and Reviews.

The Warble Flies of Cattle.

In a brief introduction the author points out that although the first proof that the lesion of the skin of cattle known now as warbles is produced by the larva of a fly was furnished 200 years ago, it was not until 1915 that the mode of entry of the parasite was settled.

While lacunae in our knowledge still require to be filled in, the general facts regarding the pest are now known.

The author then passes to a description of the bionomics of *H. bovis* and *H. lineatum* as at present known. Subsequently he discusses the evidence upon which the life-histories have been worked out, and, in the last two sections of his paper, deals with the injuries produced, and the distinguishing features of the two flies.

Both species occur in England, while *H. bovis* is the prevalent species in Ireland and *H. lineatum* in America. In all places where the fly occurs it makes its appearance, at any rate in numbers, at the beginning of the hottest period of the year—in England in July, as a rule, for *H. bovis*, and rather earlier for *H. lineatum*. The latter may be caught as early as April.

H. bovis oviposits on hot sunny days and lays the eggs singly at the base of the hairs. *H. lineatum* is less dependent upon sunshine and may place as many as 14 eggs on a hair. Oviposition generally takes place on the legs.

Yearlings are more parasitized than calves, and these more than adults. The larvae, which hatch out in about 4 days (*H. bovis*) or rather longer (*H. lineatum*), penetrate the skin. During the autumn and winter the larvæ appear in a submucous position in the œsophagus, but it is not known how they reach this position. They disappear from this position by March. Some of the larvæ in their migrations reach the spinal canal, where they may be found during the winter between the periosteum and the dura mater. From here the final and invariable position under the skin on the back is reached. Here an orifice is made through the skin towards which it directs its hinder end. Growth then takes place rapidly. Most of the larvæ quit their subcutaneous position during May and crawl into a hole in the ground Pupation takes place and lasts about five weeks. The imago then emerges.

In connection with the "gadding" caused by the fly, it is pointed out that oviposition causes no pain,

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category and the proper treatment decided. We welcome further papers on this subject, and hope that it will be brought before some of the divisional meetings during the winter.

and CARPENTER'S explanation (1914) is reproduced that the animals' legs are specially susceptible to the irritation of the repeated attacks of the fly. The flies will not fly over water and cattle frequently protect themselves by making their way into ponds or rivers.

[WARBURTON (C.). The Warble-Flies of Cattle, *Hypoderma bovis* and *H. lineatum*.—*Parasitology*. 1922. Dec. Vol. 14. No. 3—4. pp. 322—341. With 3 text figs. *Ex. Trop. Vet. Bull.*]

The Origin and Prevention of Anthrax.

Anthrax in its causation and prevention is essentially an occupational problem, at least in industrial countries. Study of its prevalence in Germany* during the past decade indicates how it originates and at the same time the lines which must be pursued to eradicate it.

Notified Cases of Anthrax.

Year.	Animals.	Human beings.
1912	6283	274
1913	6816	224
1918	1002	29
1919	743	18

Clearly the chief source of infection both for animals and man is raw material imported from abroad, the supply of which was largely cut off during the war. From 1910 to 1921, out of 1458 cases about one-half (746) occurred among those employed in agriculture, a higher proportion than occurs in this country. When the remaining cases are distributed among the three main industries concerned, a great difference is found between Germany and Great Britain; the difference is due no doubt to the comparatively small woollen industry in Germany.

	Number of cases, 1910–21.	
Industry..	Germany.	Great Britain.
Hides and skins	538	198
Hair and bristles	113	60
Wool	4	443

Great Britain has already led the way in establishing a Government disinfecting station at Liverpool for dealing with infected wool. Germany has now to come to grips with her particular problem, the disinfection of imported hides and skins. Among tanyard workers the source of infection was traced in 335 cases, of which only 19 were due to home hides. Anthrax in home animals arises chiefly from infection carried on to pasture land by waste water from tanyards, so that disinfection of imported material would presumably eradicate the disease.

Three disinfecting processes are known: (1) the Seymour-Jones process, in which the hides are treated with a solution of 0·02 per cent. chloride of mercury and 0·9 per cent. formic acid; (2) the pickling process, in which a solution of 1 to 2 per cent. hydrochloric acid and 10 per cent. sodium chloride is used at a temperature of 20° to 40° C.; and (3) the lye process, the basis of which is a 0·5 per cent. soda lye with 1 to 10 per cent. sodium chloride. The two last are considered better than the first; but

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* A Survey of Occupational Anthrax in Germany, International Labour Review, vol. viii., No. 2, August, 1923, pp. 268-278.

Association Reports.

Midland Counties Division.

The quarterly meeting of the Midland Counties Division was held at the Crown Hotel, Leamington, on Friday, August 31st, and the proceedings were arranged to take place in the morning, in order that the remainder of the day might be devoted to pleasure, in which ladies were invited to participate. There was a numerous attendance, a good proportion of those present being members of the fair sex, and, although the weather was somewhat unsettled, the social side of the day's proceedings proved exceedingly enjoyable. An excellent lunch followed the business meeting, and then came a motor drive to Warwick, where the party were made the guests of Mr. and Mrs. R. B. Palmer, who entertained them to tea at the Woolpack Hotel and made the necessary arrangements for an inspection of the Castle. The beauties of the place were universally admired, and a very interesting programme made the occasion one that will be long and pleasantly remembered.

The President (Mr. A. B. Forsyth, of Cannock) was accompanied by Mrs. and Miss Forsyth, and there were also present Mr. and Mrs. W. H. Brooke and Miss Brooke (Handsworth), Mr. and Mrs. B. De Vine (Birmingham), Mr. and Mrs. H. J. Dawes (West Bromwich), Mr. and Mrs. H. L. Pemberton (Bridgnorth), Mr. and Mrs. A. Renfrew (Broadway), Mr. and Mrs. J. A. McLauchlan (Stourport), Mr. and Mrs. R. B. Palmer (Warwick), Mr. S. M. Woodward and Mrs. Nickolls (Birmingham), Mr. and Mrs. W. E. Blackwell (Towcester), Mr. and Mrs. G. E. Gibson (Newport Pagnell), Mr. T. H. Hobson and Mrs. Thornton (Leicester), Colonel G. K. Walker (Principal, Punjab Veterinary College, India), Dr. O. Charnock Bradley (Principal, Dick Veterinary College, Edinburgh), Mr. W. Brown (Aberdeen), Mr. J. Martin (Wellington), Mr. L. W. Heelis (Solihull), Mr. W. F. Aston (Ludlow), Mr. and Mrs. Barker (Hereford),

(Continued from previous column.)

each has its special advantages. Pickling takes place before liming, and treated hides can be salted and kept. The lye process may be combined with liming or softening, but hides treated are unsuitable for keeping; hence while valuable at tanyards, it is not suited for separate disinfecting stations. The next important decision to be arrived at is whether disinfection, which has been proved to be practicable, should take place in stations at the principal ports of import or in the tanyards themselves. Dr. H. Leymann rather favours disinfection at the tanyard. Certainly all suspected wool on import can be more easily passed through our disinfection station at Liverpool than could hides and skins coming into Germany by a number of channels be directed through a few stations; expense and hindrance to commerce would be entailed, but more certain disinfection would be ensured.—*The Lancet.*

Mr. Steele-Bodger (Tamworth), Mr. G. Howie (Birmingham), Mr. H. W. Dawes (West Bromwich), Mr. F. B. O. Taylor (Redditch), Mr. W. E. Ison (Atherstone), Mr. A. Renfrew, jun., and Mr. C. Renfrew (Broadway), Mr. Forsyth, jun. (Cannock), Mr. and Miss V. Gold (Redditch), Mr. T. Slipper (Sutton Coldfield), Mr. Banham (Stratford-on-Avon), and Mr. J. W. Conchie and Mr. J. Conchie (Kidderminster).

Apologies for unavoidable absence were received from Professor Hobday (London), Messrs. R. Cockburn (Eastwood), J. J. Burchnall (Barrow-on-Soar), F. Thompson and A. Mackenzie (Market Drayton), J. T. Brain (Cheltenham), J. E. Hutchinson (Eccleshall), L. C. Tipper (Birmingham), A. W. Findley (Kineton, Warwick), H. A. Turner (Derby), T. V. Steward (Hereford), L. C. Maguire (Stow-on-the-Wold), J. Bainbridge (Brough), E. Hall (Willington), R. C. Trigger (Newcastle-under-Lyme), R. L. Phillips (Loughborough), H. Tudor Hughes (Oswestry), R. Hughes (Oswestry), H. S. Reynolds (Daventry), F. Chambers (Dudley), W. W. Grasby (Daventry), D. Forwell (Towcester), J. Robertson (Stourbridge), R. L. Green (Dudley), T. Chambers (Dudley), R. Over (Rugby), J. L. Cormack (Coventry), J. R. Carless (Shrewsbury), T. D. Martin (Wellington), M. Tailby (Birmingham), J. T. Allen (Burslem), E. Franklin (Worcester), J. R. A. Jones (Gloucester), T. Spencer (Kettering), F. L. Gooch (Stamford), and others.

Mr. H. J. DAWES (the Hon. Secretary), who was absent from the previous meeting through illness, said he desired to thank the Association for the very kind message of sympathy forwarded to him on that occasion. He appreciated it very much as a testimony, were any needed, of the good feeling which existed between himself and his fellow members.

Nominations and Elections.—The HON. SECRETARY nominated the following gentlemen for membership of the division:—Mr. T. Wilson, of Nantwich, Mr. A. Renfrew, jun., and Mr. C. Renfrew, of Broadway. In the case of the brothers Renfrew, he said he nominated them with especial pleasure, because they were following in the footsteps of their father, who was one of the oldest and most respected members of the division.

Mr. STEELE-BODGER nominated Mr. G. V. Tyerman, of Ludlow.

Mr. A. A. Forsyth, of Cannock, who was duly nominated at the previous meeting, was elected a member of the division. In proposing him, the Hon. Secretary said that, as the son of their esteemed President, the candidate required no further recommendation.

Mr. W. J. Bainbridge, of Whitchurch, was also elected a member.

The Days of Meeting.—The following motion, in the name of Mr. Conchie, was introduced, in his temporary absence, by the Hon. Secretary. He said Mr. Conchie's idea was that many country members were engaged at stock sales during the first few days of the week, and that, by having the meetings on a Friday, they would ensure a better attendance.

Mr. HEELIS, in seconding, said it was difficult for him, as a country practitioner, to attend in the early part of the week.

Mr. MARTIN, who claimed to have no personal feeling in the matter, moved as an amendment that the present system of holding the meetings alternately on Tuesdays, Wednesdays, Thursdays and Fridays, be adhered to. They were a successful society, and he could not believe that the proposed change would be helpful.

Mr. ASTON seconded, and said he knew several auctions that were held at the end of the week.

On a vote being taken, the amendment was declared to be carried.

The HON. SECRETARY announced the receipt of a long letter from the *Field* Distemper Fund, to which the division subscribed, reporting progress. This had already been reported in the veterinary press.

A letter had also been received from the Poultry Research Fund, and he suggested that it be deferred till Mr. Tipper could attend, as it was he who had brought the matter forward. This was agreed to.

THE DICK CENTENARY CELEBRATION.

Dr. O. C. BRADLEY, called upon by the President, made a reference to the movement for a fitting celebration of the centenary of the Edinburgh Veterinary College. It was, he said, suggested that commemoration should take the form of something that would be of value to the profession as a whole. By that means it was believed that the aims and ideal of the founder would be best realised, because everyone must admit that William Dick lived solely for the uplifting of the Veterinary Profession. The idea was to institute an advanced study fellowship, by which it was hoped an opportunity might be afforded to a promising young graduate of visiting the continental laboratories and bringing back knowledge which would be of use in this country. To establish such a fellowship on a sound basis would require a considerable sum of money, and the promoters aimed at £10,000. It was perfectly obvious that no veterinary college could raise a sum like that without outside assistance, and they therefore threw themselves upon the good will of the profession generally. They did so without any qualms, because they thought the profession would ultimately benefit. He urged each member of the profession to interest himself in the movement and help to raise the money in one way or another. As the time was now short, he was impressing upon his friends the need for strenuous endeavour, and he asked the members of a division such as that not to be satisfied with the corporate contribution which the division might take, but to send individual subscriptions as well.

Mr. ISON said he had been appointed chairman of a committee of the division to devise means of helping the scheme forward, and as soon as they had received a lead from the division they intended getting to work. They proposed sending a circular to members appealing for subscriptions, and he hoped there would be a generous response.

The HON. SECRETARY said he considered this was a matter which should commend itself to the division. He noticed that they had 25 or 30 members who were graduates of the Dick College, and he thought the rest of the members would like to unite with them in doing something for that famous institution. He had often been privileged to visit the College, and in the matter of staffing and equipment it was second to none in the United Kingdom. He proposed that that division contribute a sum not exceeding ten guineas to the Centenary Fund.

Mr. RENFREW said he had pleasure in seconding. Those of them who had not graduated there could not but feel that this was a step in the right direction.

The resolution was carried unanimously, as was a further motion definitely fixing the contribution at ten guineas.

FEES UNDER THE DAIRIES ORDER.

The HON. SECRETARY said that, during the presidency of Mr. De Vine, he received a letter from the Secretary of the National Veterinary Association announcing the appointment of a special committee to inquire into the fees to be charged under the new Dairies Order. He (the Hon. Secretary) attended that meeting as the representative of that division, and he had the honour of being elected chairman of it. The Committee had met several times, and they drew up a scale of fees, but it was not considered satisfactory, and the matter was to be further considered at another meeting to be held in a week or two.

THE HON. SECRETARY AND THE NATIONAL PRESIDENCY.

Mr. BROOKE referred to the honour recently conferred upon the Hon. Secretary by his appointment to the presidential chair of the National Veterinary Medical Association. The division felt it was an honour to them, and it was one which the long service of Mr. Dawes to the profession richly merited. Mr. Dawes was known throughout the length and breadth of the land as an earnest worker, and that division owed more to him than to any other man. He moved that a record be made in the minutes of their high appreciation of the National Veterinary Medical Association's choice of a President, and that they tendered their congratulations to that gentleman.

Mr. DE VINE seconded, and said the National were not slow to recognise the good qualities of Mr. Dawes, who, he was quite sure, would add lustre to the important office to which he had been called.

The resolution having been heartily carried, the HON. SECRETARY thanked the division for their congratulations. He said his election came to him as a great surprise, and he looked upon it as an honour to the Midlands as much as to himself. He trusted his friends would support him at Aberdeen next year, and would try to make a trip to Scotland fit in with their summer holidays.

THE SANITARY CONGRESS.

The PRESIDENT presented the following report on the recent Congress of the Royal Sanitary Institute, which he attended as a delegate from that division. He said the president of the Veterinary Section was Dr. O. Charnock Bradley, who addressed the meeting, and there were about 70 or 80 delegates present.

Mr. Gofton read a very interesting and instructive paper on "Food Poisoning," and after considerable discussion the following resolutions were moved and eventually carried:—

1.—"That in the opinion of this meeting it is highly desirable that all places in which food is prepared for human consumption for gain should be registered with the object of ensuring adequate supervision and proper control."

2.—"That all cases of suspected food poisoning should be notified to the local authority, and that the Council of the Royal Sanitary Institute be requested to petition the Ministry of Health to that effect."

Mr. T. Parker, on behalf of Councillor D. Adams, J.P., M.P., proposed:—

"That this meeting calls upon the Council of the Royal Sanitary Institute to strongly urge upon the Government the imperative necessity of at once putting into force the Milk and Dairies Consolidation Act of 1915 and the Tuberculosis Order of 1914."

Mr. Gofton seconded this resolution, which was carried unanimously.

Mr. J. D. Whitehead then read a paper on "The Spread of Tuberculosis amongst Animals," which was also well received and discussed. The following resolutions were put to the meeting and carried:—

"That having regard to the wide spread of tuberculosis in this country, it is in the public interest desirable that the Ministry of Agriculture should be requested to investigate the spread of tuberculosis in cattle with a view to a means of reduction of the extension of the disease."

"That in the opinion of this meeting it is desirable to allow the introduction of breeding heifers from Canada, subject to their being accompanied by a certificate that they are free from the disease of tuberculosis."

The discussion on Mr. R. Simpson's paper on "The Disposal of Diseased Carcases" was opened by Mr. J. S. Lloyd and duly discussed by Mr. Hayhurst and others.

A vote of thanks to the chairman then terminated the proceedings.

He (the President) thought it unfortunate that a greater number of the members of the profession did not take advantage of the opportunity of attending the Congress. Interesting and important matters were discussed, and it might be to their advantage to be more largely represented. It was a most enjoyable outing, hospitality being liberally dispensed all round, and there was no lack of entertainment.

Mr. DE VINE proposed a vote of thanks to the president for his services and for his interesting statement of what was done at the Congress. He agreed

that it was very essential for the Veterinary Profession to be represented at gatherings of that kind, and it was by that means that they could make themselves better known to the outside world.

Mr. BROOKE seconded and endorsed all that had been said of the value of such gatherings to science in general and to their own profession in particular.

The vote of thanks was heartily carried.

A discussion followed on a paper on "Grass Sickness in Horses," by Mr. William Brown, M.R.C.V.S., Lecturer in Veterinary Hygiene at the College of Agriculture, Aberdeen.

[Mr. Brown's paper, together with the ensuing discussion, appears elsewhere in this issue.—ED.]

A vote of thanks to Mr. Brown for his paper was moved by the PRESIDENT, seconded by the HON. SECRETARY and carried by acclamation.

Next Quarterly Meeting.—The Council, which sat immediately prior to the general meeting, recommended that the next quarterly meeting be held at Leicester, that Mr. H. Stainton be asked to give a paper on skin diseases of the dog, and that Mr. G. H. Livesey be asked to open the discussion.

On the motion of Mr. DE VINE, seconded by Mr. ISON, it was resolved to act on the Council's recommendation.

THE LUNCHEON.—At the luncheon, a few toasts were submitted briefly and accepted with enthusiasm. Chief among these, after "The King," was the health of the President and Mrs. Forsyth. This was proposed by Mr. DE VINE, who welcomed the presence of ladies, and said the President was to be thanked for having encouraged the idea.

The PRESIDENT, having suitably replied, proposed the healths of the Visitors, commenting on the fact that they were honoured by the presence of the principals of two veterinary schools in Dr. Bradley and Colonel Walker.

Other toasts included "The Ladies," humorously proposed by Dr. Bradley, and responded to by Mr. Brown.

A special vote of thanks was accorded to Mr. and Mrs. R. P. Palmer, of Warwick, who entertained the company to tea, and who had also greatly assisted in making the necessary arrangements for the picnic.

H. J. DAWES, *Hon. Secretary.*

RETIREMENT OF MR. D. S. PRENTICE.

Mr. D. S. Prentice, M.R.C.V.S., Head and Chief Inspector of the Veterinary Branch, Irish Agricultural Department, who has retired after 40 years' service, was originally appointed Inspector of the Veterinary Department, Irish Privy Council, and transferred to the Agricultural Department on the passing of the Act of 1899. He was responsible for many of the arrangements made for the more humane transit of cattle, and the fine laboratory at Thorndale, Drumcondra, was recently constructed under his supervision.

The Model Abattoir Society announce that the second Benjamin Ward Richardson annual memorial lecture will be delivered by Sir Arthur Newsholme on Thursday, October 18th, at the Robert Barnes Hall of the Royal Society of Medicine, 1 Wimpole Street, Cavendish Square. Sir James Crichton Browne will preside at the lecture, the subject of which will be "Humane Slaughtering in relation to Public Health."

The Overstocking of Cows.

Numbered amongst those activities of the R.S.P.C.A., which are viewed with a considerable measure of sympathetic appreciation by many of our members, is that of prosecution in flagrant cases of the practice of the overstocking of cows at markets, or elsewhere, in order to impress the intending purchaser with the milking capacity of the animal as seemingly evidenced by the size of the udder. In forwarding us the following report of a prosecution, and editorial comment thereupon, in the *Eastern Daily Express*, Mr. H. Buckingham says: "I do feel, and always have felt, very keenly upon this subject, because, in my opinion, it is inflicting cruelty for pecuniary gain, absolutely unnecessarily."

The following is an abridged report of the proceedings:—

"Cases of considerable interest and importance to farmers and dealers came before the Norwich Shirehall Bench on Saturday, when a Seething dealer was fined £10 on summonses of overstocking cows and not allowing sufficient nourishment to calves. Other defendants were fined smaller sums.

"The prosecutions were brought by the R.S.P.C.A. Alfred Lake, a dealer, of Seething, was summoned for causing unnecessary suffering to five cows at Trowse between August 30th and September 2nd by causing them to become overstocked with milk. He was also summoned for cruelty to five calves by unreasonably withholding sufficient nourishing food from them.

"Mr. C. B. Hill prosecuted for the society and Mr. W. E. Keefe was for all the defendants.

"Mr. Hill, in opening the cases against Lake, said there were two charges against him. First there was a charge of overstocking five cows, and secondly there was a charge of cruelty by not providing proper nourishment to five calves. The facts were that on Friday, August 31st, about six in the evening, Police-constable Oldman saw a number of cows and calves at Trowse. They were being driven by a man named Betts from Trowse Station. The calves were muzzled, and one in particular was in a weak condition. It was apparent from the udders of the cows that they had not been fully milked. Police-constable Oldman made a communication to Betts, and the cows were put into an adjoining field. Later on they were removed to the field of Mr. Harris, who he (Mr. Hill) was instructed was the man who found accommodation for the stock of dealers so that they could be ready for the Norwich Market on the following day. Eventually the cows and calves were put in Harris's field, the calves being left muzzled. Having regard to the condition of one of the calves, Police-constable Oldman procured some milk and fed it. On the following day Oldman went to the field early in the morning, and noticed that the cows and calves were all in a bad condition. The calves were still muzzled. The constable communicated with Inspector Oxby, who arrived about eight o'clock. Mr. Harris arrived about 8.30. In consequence of a conversation between Harris and the Inspector the muzzles were removed from the calves, and they were allowed to go to the cows. At first two or three cows refused to allow the calves to take milk, and they were obviously in pain. The same day the Inspector saw Lake on Norwich Hill. He told him that Harris said that five of the cows and calves were his, and that the calves were muzzled, and the cows were not milked by his (defendant's) instruction. Lake said: 'It is no good showing cows without they have got a big bag, and now I shall not be able to sell them on account of the calves sucking. You must stop other people as well as me, and there are others about equally as cruel. I shall insist on you stopping them as well.'

"The contention of the prosecution was that to allow these cows to remain unmilked was in itself an act of cruelty, and to allow the calves to be muzzled by the side of the cows was also an act of cruelty. It might be that the defence would endeavour to show that the method was one that was customary among dealers. Whether it was the custom or not was absolutely immaterial. If it was the custom, his submission was that it was time that the custom ceased, and the people should find some other means of being able to satisfy prospective purchasers whether the cows were good milkers or not.

"Police-constable Oldman gave evidence bearing on Mr. Hill's opening, and said that on the Saturday morning the cows were in great pain.

"By the Bench—In his opinion the cows had not been milked dry on the previous night, but they might have been milked.

"Inspector Oxby said when he saw the animals on the Saturday morning the cows had their backs arched.

"In cross-examination, Mr. Keefe asked—Is not overstocking a general practice? Witness—I am sorry to say it is.

"Are not overstocked cows offered for sale by auction by the principal auctioneers on the Hill? Witness—They are, and I am constantly stopping it.

"Is it not a fact that there is a difficulty in selling a cow unless the purchaser can form a proper idea of the milking capacity?—No, there is not.

"Evidence was also given by Mr. Walden, a drover, and Mr. H. Buckingham, veterinary surgeon. In cross-examination the latter said the practice of muzzling calves was often done. He had seen several muzzled calves on the Hill. In reply to another question witness said that in the veterinary profession opposition to the muzzling of calves and overstocking of cows was gaining ground.

"In reply to Mr. Tillett, witness said the practice varied. In walking across Norwich Hill calves could be seen muzzled and unmuzzled.

"Defendant's solicitor said that the practice of overstocking was so general that it did not seem to him to be quite fair for the society to select one or two people in this way and bring them before the Bench as if they were what he might call ordinary cases of cruelty, such as a case in which a man wantonly or carelessly inflicted pain. The point was before the King's Bench some years ago. What he did suggest was that if the society proposed to bring charges for overstocking, and if they let it be generally understood that prosecutions would be taken, surely some public notice could be easily given which would warn people.

"After the Bench had retired, the Chairman said: 'The magistrates are determined to do the best they can to stamp out these cases of cruelty. We consider that the treatment of the calves is the most cruel, and we shall fine you £6. In regard to the cows, here again it is very cruel, and you will be fined £4. We have been told that this practice is a dying custom. We hope this case will stamp it out altogether and that it will become extinct. It is a practice that should not be allowed to go on."

"We hope," says the *Eastern Daily Express*, "that the action taken by the R.S.P.C.A. and the decisions and comments of the Norwich Shirehall bench of magistrates on Saturday will have the effect of stopping a practice which is said to be prevalent in Norfolk, and that is of allowing cows for sale to become overstocked in order to afford ocular evidence of their milking capabilities. Those who pursue this practice, and those who take advantage of it, evidently look upon the matter purely from the commercial standpoint; they ignore the pain caused to the cow and the absence of nourishment for the calf. Calves are muzzled so that they are unable to obtain their natural food, and the cow is allowed to remain in a condition which causes acute pain and distress. We

(*Continued at foot of next column.*)

Notes and News.

The Editor will be glad to receive items of professional interest in these columns.

NOTICE TO DIVISIONAL SECRETARIES.

The Editorial Committee, wishing to be of assistance to the divisions, and with a view to achieving uniformity in the reports of meetings, and acceleration in their publication in the *Record*, are prepared to send their representative to report their proceedings.

Will Secretaries of divisions, wishing to avail themselves of this offer, forward particulars as to dates, times, and places of meeting to the Editor, 12 Buckingham Palace Road, S.W.1., at least a month prior to such meetings, when the scale of charges will be forwarded to them?

Diary of Events.

Oct. 16th—Meeting of the North Midland Division at Sheffield.

Oct. 17th—Special N.V.M.A. Editorial Committee Meeting.
Confirmatory Meeting of Council R.C.V.S., 4 p.m.

Oct. 18th—Probable date of Special Meeting of Council of R.C.V.S.
Southern Counties' Meeting at R.A.V. School, Aldershot.

Oct. 19th—N.V.M.A. Editorial Committee Meeting.

Oct. 20th—Joint Meeting of the Scottish Metropolitan and West of Scotland Divisions, at the Royal (Dick) Veterinary College, Edinburgh.

Oct. 26th—10 Red Lion Square secured for College headquarters, 1853.

Oct. 31st—Changes of address for 1924 Register to be sent to 10 Red Lion Square.

Nov. 1st—Central Division Dinner.

Nov. 21st—National Milk Conference on Pasteurisation, Guildhall, London.

Nov. 24-28th—Centenary Celebrations of the Royal (Dick) Veterinary College, Edinburgh.

Nov. 24th—Foundation of Dick College, 1823.

Nov. 30th—December Examination Fees due.

Notice to Divisional Secretaries. Will divisional secretaries kindly make a point of sending notices of *all* divisional meetings to the General Secretary at the earliest possible date for publication in the *Record*? It is our wish to make the diary as complete as possible and to make the *Record* the medium for all information useful to members. Also, will the divisional secretaries notify us if they wish a reporter to be sent to record the proceedings of their divisions?

(*Continued from previous column.*)

quite agree with the solicitor who appeared for the R.S.P.C.A. that if it is the custom it is time that the custom ceased and that people should find some other means of being able to satisfy prospective purchasers whether the cows are good milkers or not. The magistrates were no less emphatic in their condemnation. Other practices of a similar nature, happily now obsolete, were strenuously defended on the grounds of commercial necessity, but experience has proved that the belief was unwarranted. We believe that this will also be found applicable in this instance, but in any case nothing can justify the unnecessary suffering caused."

Once more we have to regret missing a meeting of the South-Eastern Division. No notice was received and no intimation appeared in the usual place in the *Record*. Having promised to attend, and having an especially pleasant invitation to come to the meeting from the President, Major Dunkin, the General Secretary would not wish the members of the South-Eastern to believe him so lacking in politeness as not to have made a very special effort to be present.

* * * *

Wednesday, Thursday and Friday of last week were heavy days and full of labour. But useful results will follow, which will be fully reported in future issues of the *Record*. The four meetings on Wednesday on business of this Association were remarkable for the amount of work accomplished in the short time at our disposal. One decision arrived at was to seek new offices more suited to our increasing importance and increasing work. We hope to be able to obtain premises where members can meet and where they will come personally to make their enquiries.

* * * *

Amongst the powers secured by the Maidstone Corporation under its new Act are the following, which are also in operation in the Borough of Swansea:

"Every veterinary inspector of the Corporation may exercise the powers of Section 116 (Power of Medical Officer of Health to inspect meat, etc.) of the Public Health Act, 1875, in the same manner as the medical officer or the sanitary inspector, and the Public Health Acts shall apply within the borough as if such sanitary inspector were mentioned in the said Section in addition to the medical officer and the sanitary inspector."

Royal Army Veterinary Corps.

LONDON GAZETTE. WAR OFFICE. TERRITORIAL ARMY.

October 2nd.—Major F. W. Pawlett, T.D., ceases to command a Cavalry Mobile Veterinary Section (April 29th, 1922).

Captain A. Walker, F.R.C.V.S., resigns his commission (October 31st) and retains rank of Captain with permission to wear prescribed uniform.

(*Continued from next column.*)

far outlived any other cow the owner has possessed. Authentically she is 23 years old, and has regularly calved down every year, starting her lactation period with a yield of five gallons. She has had every opportunity of becoming infected with T.B.—Yours truly, W. S. STEVENS, M.R.C.V.S.

Wincanton, Somerset.

The Editor begs to acknowledge the receipt of the following:—

Report of a meeting of the North of Scotland Division from Mr. G. Howie Alford, Hon. Secretary.

Communications from Colonel E. E. Martin (Simla) and Captain L. P. Pugh (Sevenoaks).

Clinical note from Mr. H. C. Ganguly (Bengal).

Report of R.C.V.S. quarterly meeting of Council from Mr. F. Bullock.

Report of North Midland Division Meeting from Mr. J. S. Lloyd, Hon. Secretary.

Report of Lancashire Division Meeting from Mr. J. Spruell, Hon. Secretary.

Article from Lt.-Col. T. D. Young.

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Preparturient Milk Fever.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—It may interest Mr. Percy Gregory, M.R.C.V.S., who reported a case of preparturient milk fever in last week's *Record*, to know that I attended to two similar cases this summer.

One recovered within 12 hours, and calved the following day. The other, unfortunately, was found in a ditch, having apparently got in during her struggles in attempting to rise. She was hauled out, and I delivered her of a live calf late in the evening. She died, however, because the owner left her where she was for the night and would not allow me to "tap" her, in spite of the fact that I pointed out to him the danger of leaving her in that state—when the rumen was already very tympanitic. He said he would chance it, as she could be sold in a day or two if she got up, whilst, if I punctured her, she could not be sold for some considerable time. Nevertheless, it was a true case of preparturient milk fever.

Whilst on the subject of milk fever, it may be of interest to some of your readers that another case to which I attended 24 hours after calving was up in six hours, "doing well," and appearing perfectly normal during that day—performing all functions, but had a relapse during the night. This second attack was of just the same severity as the first one—no milder and no more severe. The same treatment was applied—inflation—and she was up and "doing well" within 12 hours, and made a good recovery. Both the preparturient cases and this one set one thinking about the pathology of milk fever. Two notable features about this disease during the past season were, firstly, its prevalence and secondly, the absence of violence—or in other words, the mildness of the attack.—Yours truly, H. LLEWELYN-JONES, M.R.C.V.S., Denbigh.

September 25th, 1923.

Welsh Black Cattle and Tuberculosis.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—In a recent issue of the *Record*, Mr. Gardiner, by his rather laboured eulogy of Welsh Black Cattle, seems to be under the impression that, at the meeting of the Mid-West Veterinary Society, the question of the freedom of Welsh Black Cattle from tuberculosis was questioned.

Perhaps Mr. Roberts, in his enthusiasm for the breed, did not read carefully the paper and discussion, as no one suggested that what was stated in my paper was not the case.

I mentioned the breed of Welsh Black in conjunction with Channel Island Cattle (and there are others) as being particularly free from tuberculosis.

Someone suggested that the breed was wild, and that was the controversial point.

Speaking for myself, having practised in Wales, and also had experience of this breed elsewhere, I have found them more docile than Shorthorns.

What is, however, from our point of view as veterinarians I think a more important question is: Whether these breeds have any resistance *per se* to the tubercule bacillus, or is their freedom from tuberculosis a matter of luck, due to environment?

I throw out the suggestion that Welsh Black are resistant *per se* from, say, constitution, and Guernseys from environment.

A Welsh Black cow I know (photograph enclosed) is a single one in a herd of milking Shorthorns, and has

(*Continued in preceding column.*)

"SALOFORM" PESSARIES.

Of great value in all cases of parturition in cows or mares, and if administered immediately after parturition will prevent the after-birth becoming foul, and keep the uterus clean and healthy.

These Pessaries are highly recommended by members of the profession who have used them, and repeated unsolicited testimony to this effect has been received. Those who have not tried them are earnestly requested to send for a sample dozen, which will be sent by post on receipt of the price as shown.

Yellow - 9/-; White - 8/-; Red - 7/- per dozen net.

HARKNESS, BEAUMONT & CO.,

Wholesale Chemists,

JUNCTION BRIDGE, LEITH, EDINBURGH.

HÆMORRHAGIC SEPTICÆMIA

Prevention and Treatment

Three types of biological products for the prevention and treatment of hæmorrhagic septicæmia (pasteurellosis) are now available, viz., bacterin, vaccine and anti-serum, and there are three varieties of each type, viz., bovine, ovine and porcine, according as B. bovisepticum, B. ovisepticum or B. suisepticum is employed in their production.

ANTI-HÆMORRHAGIC-SEPTICÆMIA SERUM (bovine, ovine or porcine) derived from the blood of horses hyperimmunised by intravenous injections of living virulent organisms. Adapted for use in prophylaxis and, more particularly, in treatment. Supplied in vials of 100 c.c.

HÆMORRHAGIC SEPTICÆMIA BACTERIN (bovine, ovine or porcine) is a suspension of *killed* organisms (5000 millions per c.c.). Adapted for use in prophylaxis or treatment. Supplied in vials of 20 c.c. or 100 c.c.

HÆMORRHAGIC SEPTICÆMIA VACCINE (bovine, ovine or porcine) is a suspension of *attenuated living* organisms (5000 millions per c.c.). For use in *prophylaxis only*. The packages in which either 20 c.c. or 100 c.c. vials of this vaccine are supplied also contain an equal quantity of the bacterin, which, it is recommended, should always be given ten days prior to the vaccine. This combined treatment evokes a more enduring immunising response than is produced by the bacterin alone.

In ordering please specify whether bovine, ovine or porcine is required.
Full particulars as to dosage, etc., are contained in each package.

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